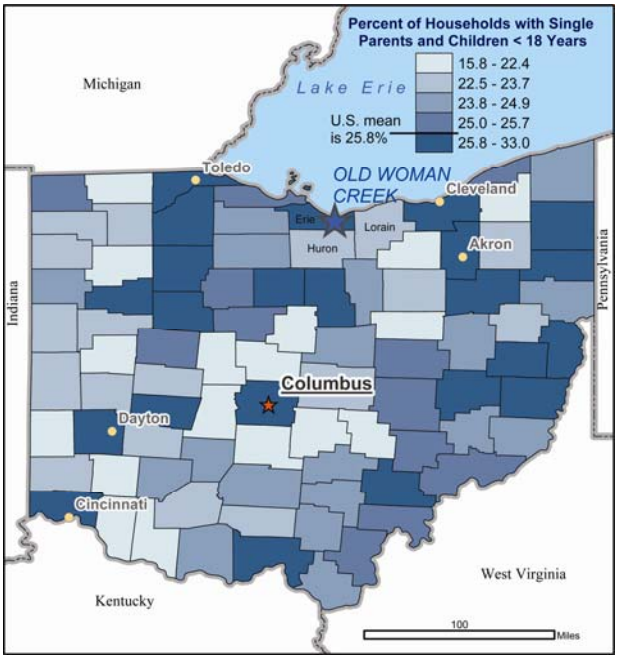
Old Woman Creek, OH National Estuarine Research Reserve

Community Characterization



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for NOAA Coastal Services Center

Training Workshop
Social Assessment: Tools and Techniques
for Coastal Managers
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Contents

A. Introduction

The Old Woman Creek National Estuarine Research Reserve is a one-square-mile site located at the mouth of Old Woman Creek in Huron, Ohio. This site was selected as a case study for this social assessment training program because it falls along a trajectory from small, rural area to densely populated urban area; because the managers and staff of the Reserve expressed a strong interest in social assessment as a tool to inform their activities; and because its situation on a fresh water system distinguishes it from other National Estuarine Research Reserve (NERR) System sites.

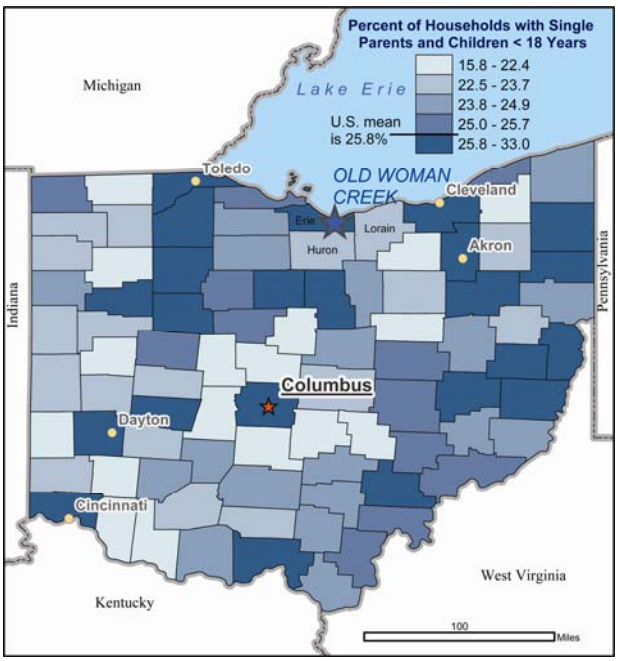


Figure 1. Location of Old Woman Creek NERR site

B. Site Description and Needs Assessment

From September 20-22, 2004, a site visit was conducted by two social scientists. During this time, meetings were held with representatives of the Old Woman Creek National Estuarine Research Reserve and some of their partner organizations, both on and off-site. Informal, semi-structured interviews were conducted with three senior citizens of nearby Berlin Heights. During a tour of the area around the NERR site, several local residents were also informally interviewed. Finally, the two social scientists were invited to attend a meeting of the Berlin Heights Historical Society during the evening of September 21, 2005. According to representatives of

this long-standing organization, the Historical Society can and regularly does reach most families in the watershed through its membership mailings.

Combined, the site visit, tour, meetings, semi-structured interviews, and participation in the meeting of a local group, provided a broad overview of the site, its location relative to other natural and human features in the system, and a sense of the organizational and managerial issues faced by the Reserve managers and staff.

The primary issues identified are common to many rural watersheds in North America: farming and the way of life it has supported for generations is in transition. Many farms are for sale, as elder owners are no longer able to manage them, and their children do not live on the farm or espouse this way of life. Thus, land is available for consolidation into agribusiness enterprises, or for development.

In the 27-square-mile region that comprises the Old Woman Creek watershed, most of the land is designated agricultural land. There are approximately 1100 people who live in this watershed, both spread across the countryside and consolidated in several small towns. These include Berlin Heights, and portions of Milan and Huron. Interviewers were surprised to find that most people they spoke with not only knew of the Reserve and of Old Woman Creek, but have strong emotional and historical ties to this watercourse and its estuary. In the past, the land at the mouth of Old Woman Creek was cultivated and harvested. Adult residents, both junior and senior, spoke fondly of playing in the creek and the woods surrounding it as children. When asked whether the area had changed much in recent times, most respondents indicated that they have not witnessed much change. However it is likely that this represents their local perspective, as Reserve managers and representatives of State agencies indicated that the landscape is in transition. Agricultural lands are giving way to retirement communities as well as developments from which people commute to Cleveland and elsewhere to work. In addition, water monitoring over time indicates that there are elevated *E. Coli* counts in the system on an ongoing basis. This has potential deleterious effects on flora, fauna, and human health.

Regionally, there are a number of issues and trends that may affect Old Woman Creek and the estuary into which it drains. In particular, the region has a heavy influx of tourists during the summer season. This can be a

benefit or burden, depending upon how it is managed. The Reserve itself hosts a number of tourist visits during the summer, which provides an opportunity to fulfill its mission of education, potentially at a national scale. However, as tourism extends beyond the Cedar Point recreational area to the west, there is also the possibility of additional shoreline development, with the potential to negatively impact the estuarine environment at Old Woman Creek and beyond.

As a result of these initial discussions, and the apparent disconnect between opinions and observations of Reserve managers and local community representatives, a number of social assessment tools were selected for analysis of the Old Woman Creek site and the communities in which it is situated. The reserve could potentially benefit from a variety of socioeconomic analyses. These include:

1. A general community characterization of the area that will allow for comparative analysis of local, regional, state, and national trends in socioeconomic variables;

2. Formal focus groups with representatives of local agencies and communities to articulate more clearly whether and how they interact with the Old Woman Creek Reserve site, whether and how they consider the landscape to be in transition, and what they consider to be potential threats and means by which they might be addressed in the area;

3. Coupled with the focus groups, a mapping exercise to identify people's "home ranges" as they relate to work, leisure, consumption, and social activities. This information can be used to evaluate people's perspectives of changing landscape patterns;

4. An environmental history of the watershed and its communities;

5. An economic analysis of the communities in the watershed and region.

This document does not address all of these socioeconomic analyses. It does, however, explain why the community characterization was undertaken at 3 levels of geography. There was a clear disconnect between people's perceptions of local trends and observations on the landscape. There is, indeed, a great deal of both residential and

commercial development taking place in the area near the Old Woman Creek Reserve. It was clear that definitions of "local" varied tremendously, depending upon whose opinion was being solicited. It was also clear that it was necessary to examine these trends at different scales; hence, the levels of analysis selected for the community characterization.

C. Community Characterization

Here, we characterize, at a broad scale, socioeconomic conditions of communities around the Old Woman Creek NERR. Information for these summaries was derived primarily from the 2000 decennial census, which was downloaded and displayed on a series of maps. The maps are included in this community characterization; each sheet includes text interpreting the findings at different scales for the variable it depicts, including state/county, and region/locale around the Reserve.

The maps present data on a subset of variables in the human ecosystem framework (Machlis et al. 1997): under Biophysical Resources, *energy*; under Socioeconomic Resources, *population, labor*, and *capital*; under Social Cycles, *institutional cycles*; under Social Order, *age*, *class, power, wealth*. Figure 2, below, shows the indicators selected for each of these variables, as well as the map sheet on which they are represented. Here, synthesis is intended to detect and present relationships among the variables shown on the maps.

Below, the findings in these maps are summarized by variable. The relationships among these variables are then discussed to provide a synthesis of findings. We conclude with suggestions for additional social assessments that might be of use to the managers of this reserve.

Figure 2.

Variable	Indicator and/or Measure	Sheet Number
Population	Number of persons per census geography	One
Population	Number of people per square mile	Two
Population	Percent change in total resident population between 1990 and 2000	Three
Age	Median age of total population	Four
Capital	Median household income	Five
Class	Percent skilled and professional workers	Six
Power	Percent of households with income over $100,000	Seven
Wealth	Percent persons living below poverty line	Eight
Institutional Cycles	Ratio of population <18 to >64 years of age	Nine
Energy	Time traveled to work	Ten
Informal Norms	Percent of households with own children under 18 years living at home, headed by a single parent (male or female)	Eleven

C-1. Population

Population includes both the number of individuals and the number of social groups and cohorts within a social system. It is an important socioeconomic resource as it determines the consumption impacts of people as well as their creative actions. Because development is an important issue at most NERR sites, three indicators of population were measured and mapped for the community characterizations: absolute population, population density, and county-level change in population between 1990 and 2000.

Ohio is among the most populous states in the US. Three counties in the region of the Old Woman Creek Reserve, Erie, Huron, and Lorain, are home to between 75,000 and 150,000 people. While there is a concentration of population in the census blocks along Lake Erie in the OWC region, the blocks immediately adjacent to and containing the reserve are among the least populated in the region.

Likewise, population density is very low in the census blocks adjacent to the Reserve, with a maximum density of 184 people/square mile. This increases quite dramatically to the east of the Reserve in the Cleveland area, where population densities approach 5000 people/square mile; and to the west in Sandusky where densities of 1250-2999 people/square mile are common. Between 1990 and 2000, the counties in the immediate environs of the OWC Reserve increased in population by up to 3.5%, while the

county in which densely populated Cleveland is located actually lost up to 8.0% of its population. It is not possible to compare these trends at the regional and locale (i.e. the census areas comprising the Reserve and its watershed) scales, as the 1990 data were not readily available along the same higher resolution census geographies as the 2000 data.

C-2. Age

Age is an important component of social structure for several reasons. Most of human activity is age-dependent. Mining, for example, is an occupation primarily carried out by the young. Certain recreational activities, such as golf, are often associated with the elderly. Age distribution within a community is also an important determinant of social institutions such as education and health care. Likewise, age can be an important factor in political activity and proclivity.

The median age of the people in Ohio is 37.5 years, substantially higher than the national median of 35.5. This means that half the people in the state are older than 37.5 and half are younger. The counties around the Old Woman Creek Reserve display variation in median age, from well above the national average (up to 48.6 years in some cases) to well below it (between 25.7 and 35.5). At the higher resolution census geography, this pattern is more subtle, with an obvious decreasing median age in the census blocks to the south (and upstream) of the watershed in which the Reserve is located. The census blocks along the shores of Lake Erie and just inland from it are among those with the highest median age in the area, clustering between 48 and 58 years old. Thus, there is a high concentration of people at or approaching retirement age in the immediate vicinity of the Reserve.

C-3. Capital

In the human ecosystem framework, capital is defined as the economic instruments of production; that is, financial resources (money or credit supply), resource values (such as underground oil), and the human ability to manipulate these (human capital). Capital can be measured in a variety of ways; for our purposes, median household income is used to measure capital.

In Ohio, there is a strong east-west pattern of southernmost counties with a median household income well below the national median (approximately

$42,000/year) and the state median ($38,726). In the counties surrounding the Old Woman Creek Reserve and its watershed, median household incomes are near or above the state median. Most of the census block groups near the Reserve exhibit median household incomes well above the state median. There are some exceptions to this, in particular in Sandusky where many block groups have median household incomes of between $4,732 and $24,999.

C-4. Class

The term, class, is used in various ways in sociology. It usually implies a group of individuals sharing a common situation within a social structure, usually their shared place in the structure of ownership and control of the means of production (Dictionary of Social Science, http://bitbucket.icaap.org/dict.pl).

Class is represented in this work as the percent of the work force who are employed in skilled or professional occupations. These include doctors, lawyers, professors, computer specialists, and so on. In Ohio, there is a wide range of levels of skilled and professional workers, with counties containing centers of population and those along the shores of Lake Erie exhibiting higher concentrations than others. Near Old Woman Creek NERR, the pattern is equally variable, ranging from 0.0-9.0% to up to 25-73.0%. Immediately to the west of the Reserve, the rates are quite high, in fact higher than the national average. However, the census block groups containing and south of the Reserve and its watershed range from 0.0-19.9%.

C-5. Power

Power is the ability to alter others' behaviour, either by coercion or deference (Wrong, 1988; Mann, 1984). The powerful, often elites with political or economic power, or both, can have access to resources denied the powerless. Here, we measure power in terms of income, with those having a household income of $100,000 or more considered to be more powerful than those with lower incomes.

In Ohio, the concentration of households with this income level ranges from 2.2%-27.5%, with power being concentrated in centers of population. In the area to the west of the Old Woman Creek Reserve, however, there is a

high concentration of powerful block groups. Within the Old Woman Creek watershed, block groups at this income level range from 0.0%-18.9%.

C-6. Wealth

Wealth is access to material resources, in the form of natural resources, capital (money) and credit. The distribution of wealth is a central feature of social inequality and has human ecosystem implications: the rich have more life opportunities than the poor. Here, we measure the inverse of wealth by examining poverty rates in the areas around the research reserve sites. The poverty line in the United States is defined as an annual income of $18,660 or less for a family of four.

In Ohio, there are many high poverty counties in the southwestern part of the state. Around the Old Woman Creek NERR, counties have relatively low poverty rates. However, the block groups around the Reserve display the full range of poverty rates, from 0-18% and above. There is a slight trend of relatively low to relatively high rates of poverty moving inland from the shores of Lake Erie and the vicinity of the OWC Reserve. The block group containing the OWC reserve itself is among those with the highest poverty rates on the coast of Lake Erie.

C-7. Institutional Cycles

Time is both a fixed resource and a key organizing tool for human behavior. Some cycles may be physiological (such as diurnal patterns); others institutional (permitted hunting seasons). Social cycles, such as the set of collective rhythms within a community or culture that organize its calendar, festivals, harvests, fishing seasons, business days, and so forth, significantly influence the distribution of critical resources.

Institutional cycles are critical to human ecosystem functioning, for they provide guidance and predictability to the ebb and flow of human action. Here, we measure institutional cycles in terms of age distribution, since the relative proportion of children to elderly will influence the need for, flow and use of different resources in a community.

In Ohio, counties with the highest ratios of children to elderly are those containing centers of population. The counties containing Cleveland and Akron are exceptions; however, the counties immediately adjacent to them show high ratios of children to elderly. In the area of the OWC Reserve,

the ratios of children to elderly range from 1 to 10, with the highest ratio southwest of the Reserve in the area of Milan. Immediately west of the Reserve, and further west along the coast of Lake Erie, the block groups are among those with the lowest ratios of children to elderly. Given the median age in these areas, this is not surprising.

C-8. Energy

Energy is the ability to do work or create heat. Energy is a critical natural resource and is tremendously influential on social systems. The energy available to humans "limits what we can do, and influences what we will do" (Cottrell, 1955). Here, we have used commuting time as a proxy measure for energy consumption. Analysis of commuting data from the US census indicated that a majority of the 128.3 million commuters in the United States travel alone by car, and travel for between 15 and 45 minutes to get to work. The percentage of commuters traveling 15-45 minutes by census geography was measured to give a sense of relative energy consumption patterns.

In Ohio, in the densely populated counties spanning the southwestern and northeastern regions of the state, 54.9-64.7% of commuters spend between 15 and 45 minutes driving to work and back. In the region around Old Woman Creek, even higher proportions of commuters spend this much time traveling: 60.5%-77.3% in the census tracts containing and to the east of the watershed. Relatively few people work at home in the watershed (<2%) or region (no more than 13.2%). This supports the observation made by Reserve managers that a relatively small proportion of the population in the area remains engaged in farming.

C-9. Informal Norms

Informal norms are the unwritten, and sometimes unspoken, rules that govern human behaviour. Informal norms are delivered to children as they are socialized; as we age, we continue to acquire expertise regarding structure and function of our social interactions. We are often unaware of informal norms until they have been violated. Here, we measure informal norms by determining the rate of single-parent households. Most single-parent households are, in fact, single-mother households: "Of all custodial parents, 85% were mothers and 15% were fathers" in 2000 (http://www.parentswithoutpartners.org/Support1.htm). Informal norms

around family structure and composition are changing in North American families.

In Ohio, the rates of single-parent households by county range from 15.8% to 33.0%. North central and southwestern counties exhibit higher rates than others. In the region around the OWC NERR, both to the east and west, there are relatively high rates of single-parent households, up to 64.5%. However, in the census block groups containing the Reserve and its watershed, the rates are among the lowest in the state, ranging from 11.3% to 17.5%.

D. Summary of Findings

The communities in the region in the vicinity of Old Woman Creek National Estuarine Research Reserve display a variety of characteristics, particularly when compared across geographic scales. At the locale or watershed scale, the population density is fairly low, with a southern/inland trend from older, affluent, more highly educated, and powerful residents to areas with higher proportions of children to elderly, and lower median incomes. Overall, the watershed displays quite low incidences of single-parent households. A large majority of commuters in the region travel quite far to work, indicating that this area may be increasingly, as indicated during semi-structured interviews with residents, a residential community to places such as Cleveland or Sandusky.

In the regions east and west of the Reserve, there are clusters of densely populated and low-income regions, with fairly strong indications of uneven distributions of affluence, poverty, and power. In addition, there are high numbers of single-parent households, both east and west of the Reserve.

The data indicate that the region comprising the Old Woman Creek Watershed is in flux. The watershed itself comprises strong communities and families, a sense of place, and a rural and small-town character. Along the shores of Lake Erie, however, the population is older and comprised of fewer families with children under 18 at home. Further afield, there are higher concentrations of poverty, denser populations, and according to interviewees, seasonal economic activity – particularly in the area around Sandusky.

The general impression, then, is one of a pocket of rural and small-town lifestyle, which is at risk of encroachment from changing economics and

demographics. To the east, Cleveland appears to be extending its reach into the watershed as commuting from the area becomes and increasingly viable and attractive option. To the west, seasonal Sandusky may be less influential. And along the shores of Lake Erie, retirees and soon-to-be retirees seem to be settling.

E. Recommended Future Directions for Related Activities at the Old Woman Creek, OH National Estuarine Research Reserve

There are a number of potential opportunities that present themselves, based on these findings, the results of interviews, and focus groups.

1) Identify a local champion, from the community, to start a Watershed Association of some sort. This can range from a small, informal group, to a fully incorporated 501(c)(3) non-profit organization. A number of landscape-level management issues identified by Old Woman Creek NERR representatives would be most effectively addressed by local people using local strategies, and their internal networks. The strength of the cohesive, small-town nature of the communities in the watershed should be investigated in more detail, and harnessed.

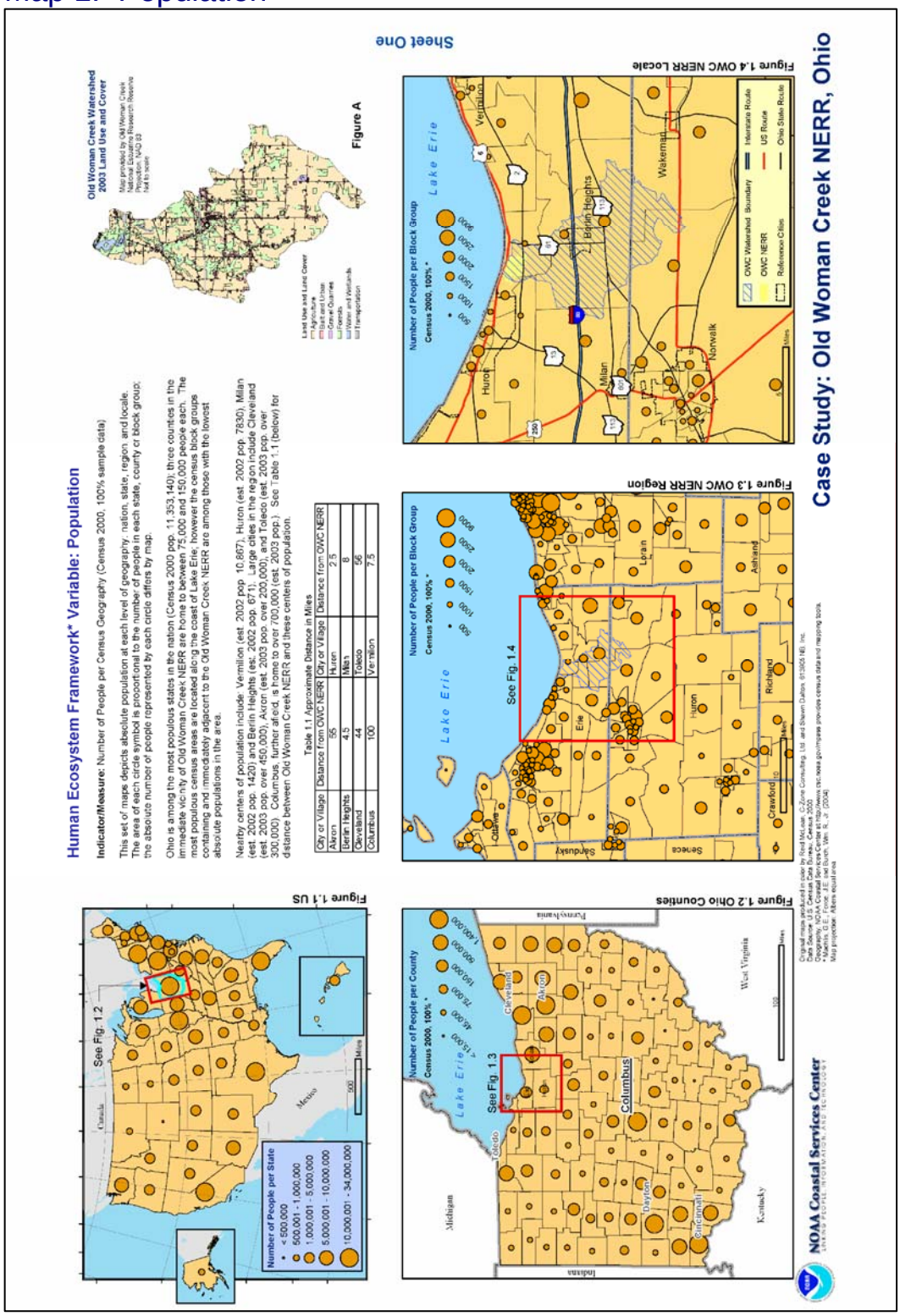
2) Engage the resources of the residents along the shoreline of Lake Erie. These are likely to be older, well-educated, and fairly affluent people. Targeting them to build up the volunteer core of the NERR makes sense, not only in terms of bringing resources into the Reserve, but also in terms of educating those with shoreline property about their land management strategies.

3) In order to develop effective and targeted communication tools, conduct more detailed community studies. Clearly, the region in the area around the Old Woman Creek Reserve comprises more than one “community.” This means that different communication and outreach tools will work differentially in different parts of the region. More detailed studies would be required to work out how these strategies, if desired, would be most effectively delivered.

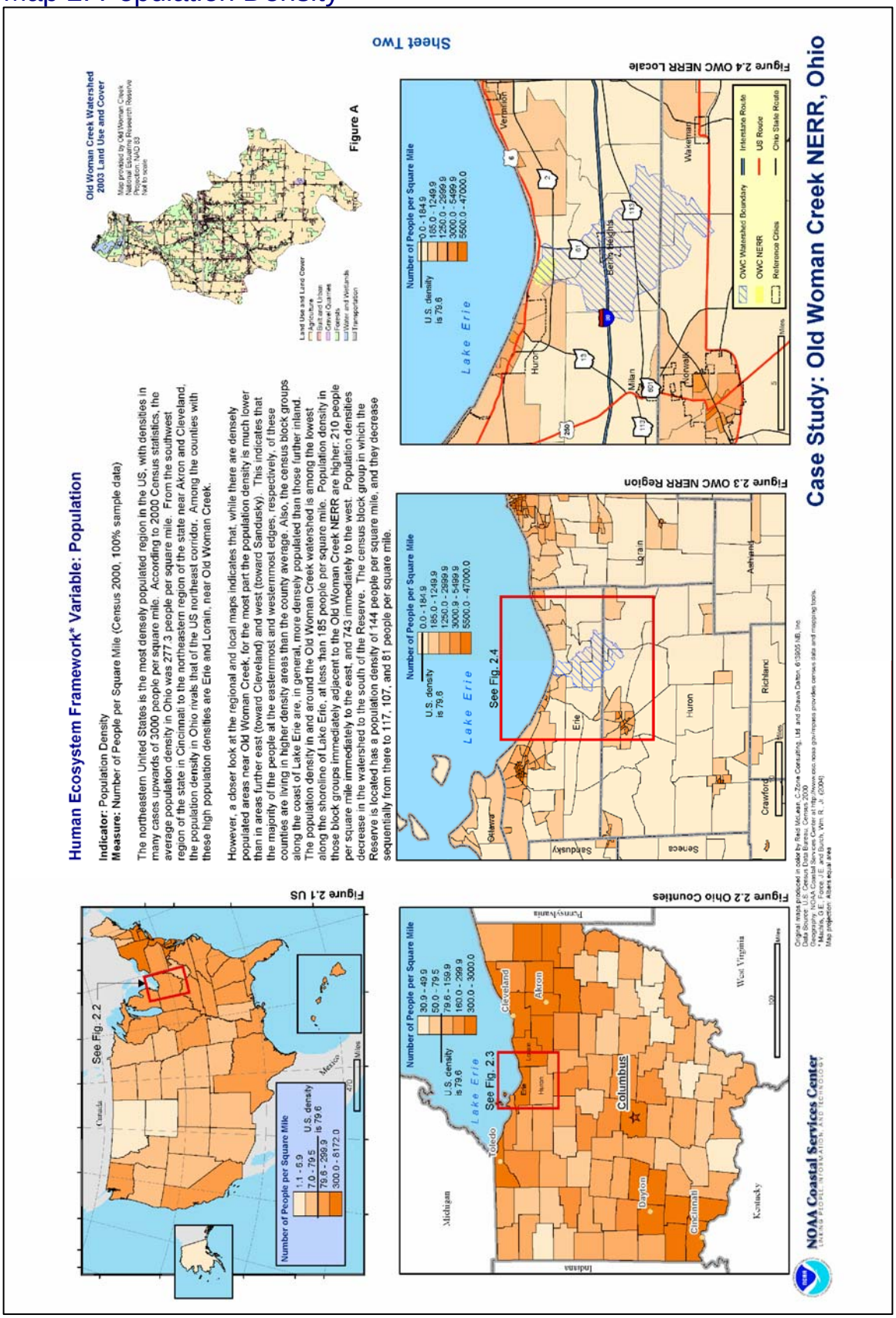
4) The high ratio of children to elderly people in the upper reaches of the watershed indicates that working with schools may be a particularly potent means of assisting land owners to protect riparian habitat and encourage other forms of landscape stewardship practices in that area.

F. Maps of Socioeconomic Characteristics: Old Woman Creek National Estuarine Research Reserve

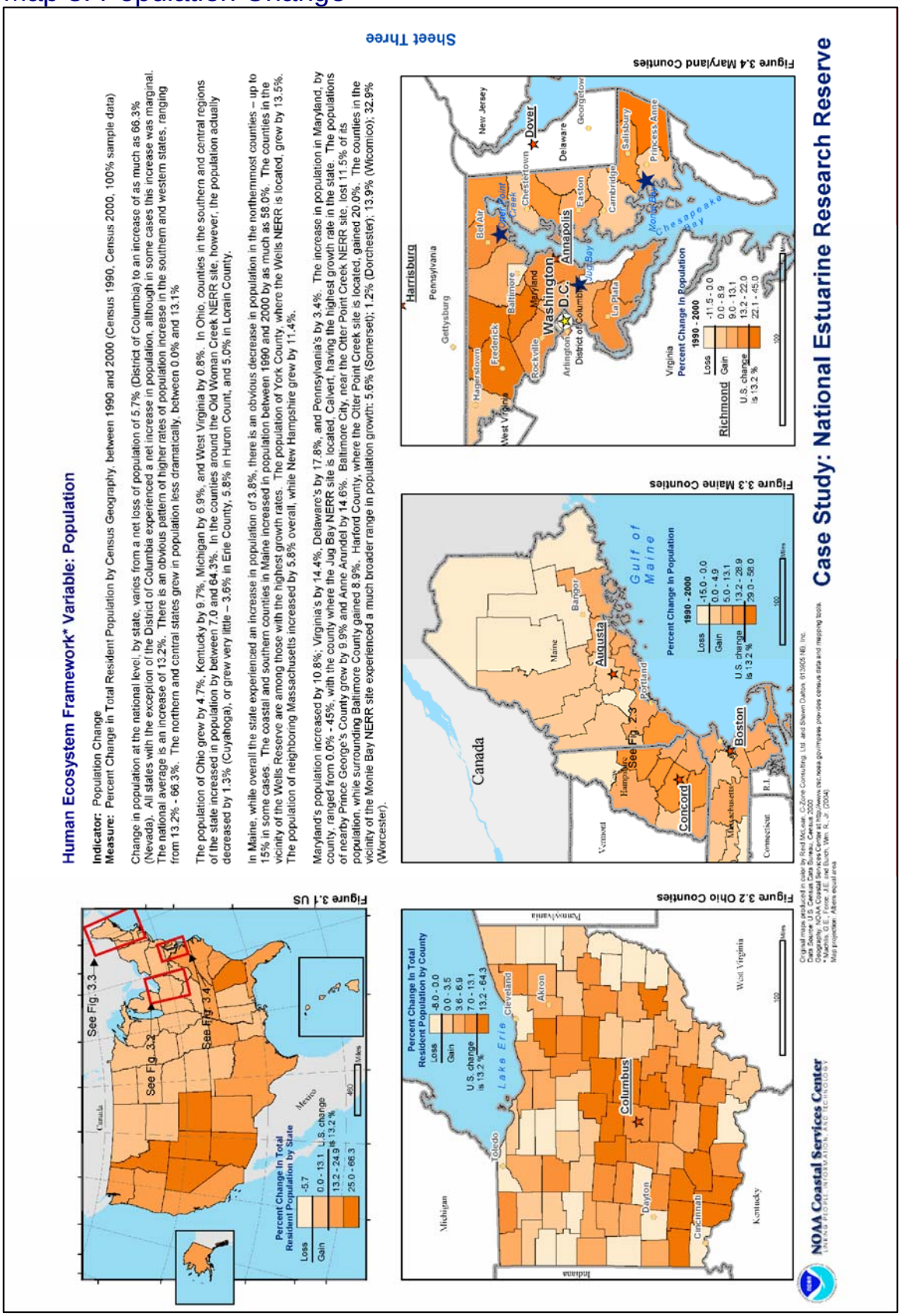
Map 1: Population



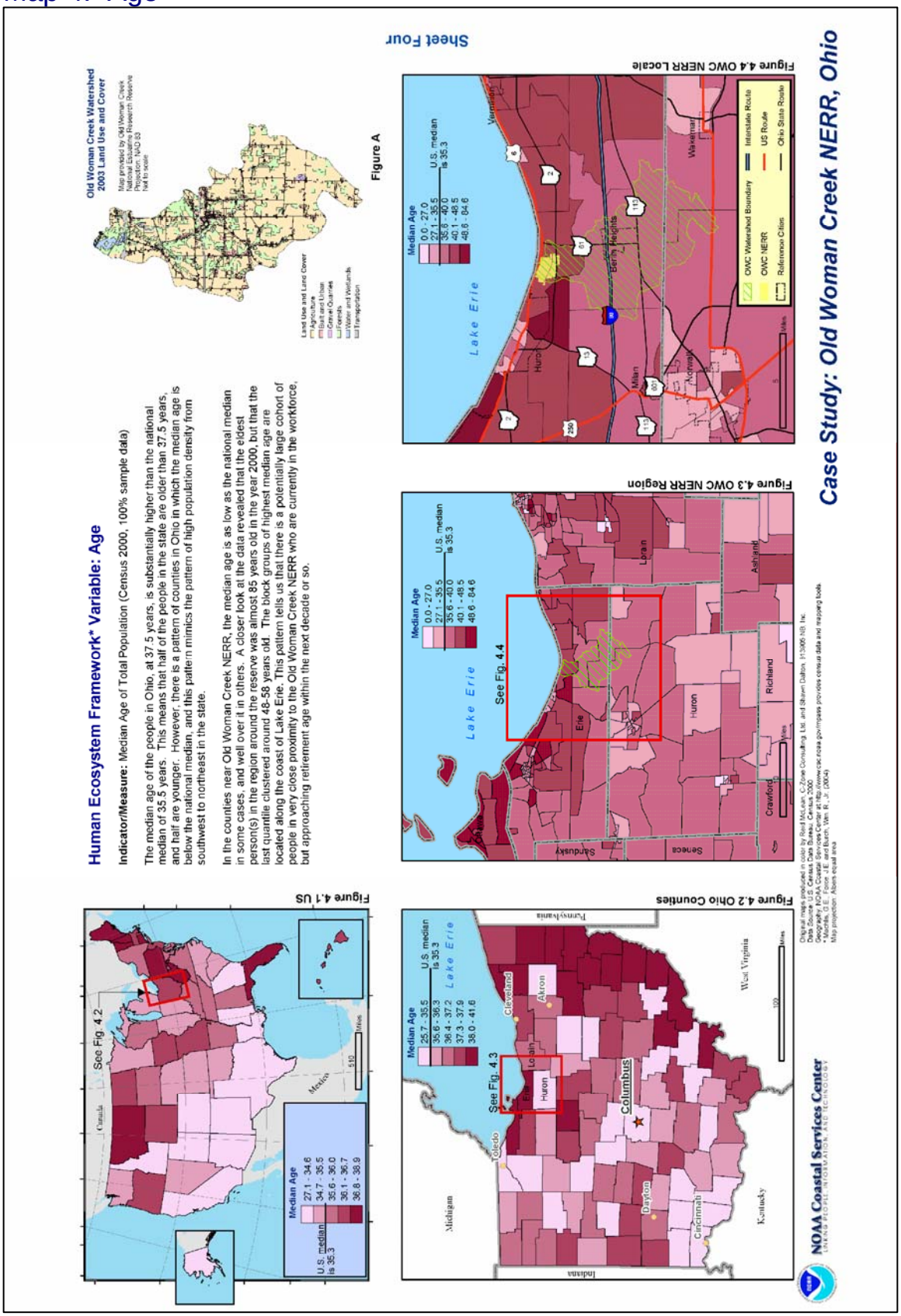
Map 2: Population Density



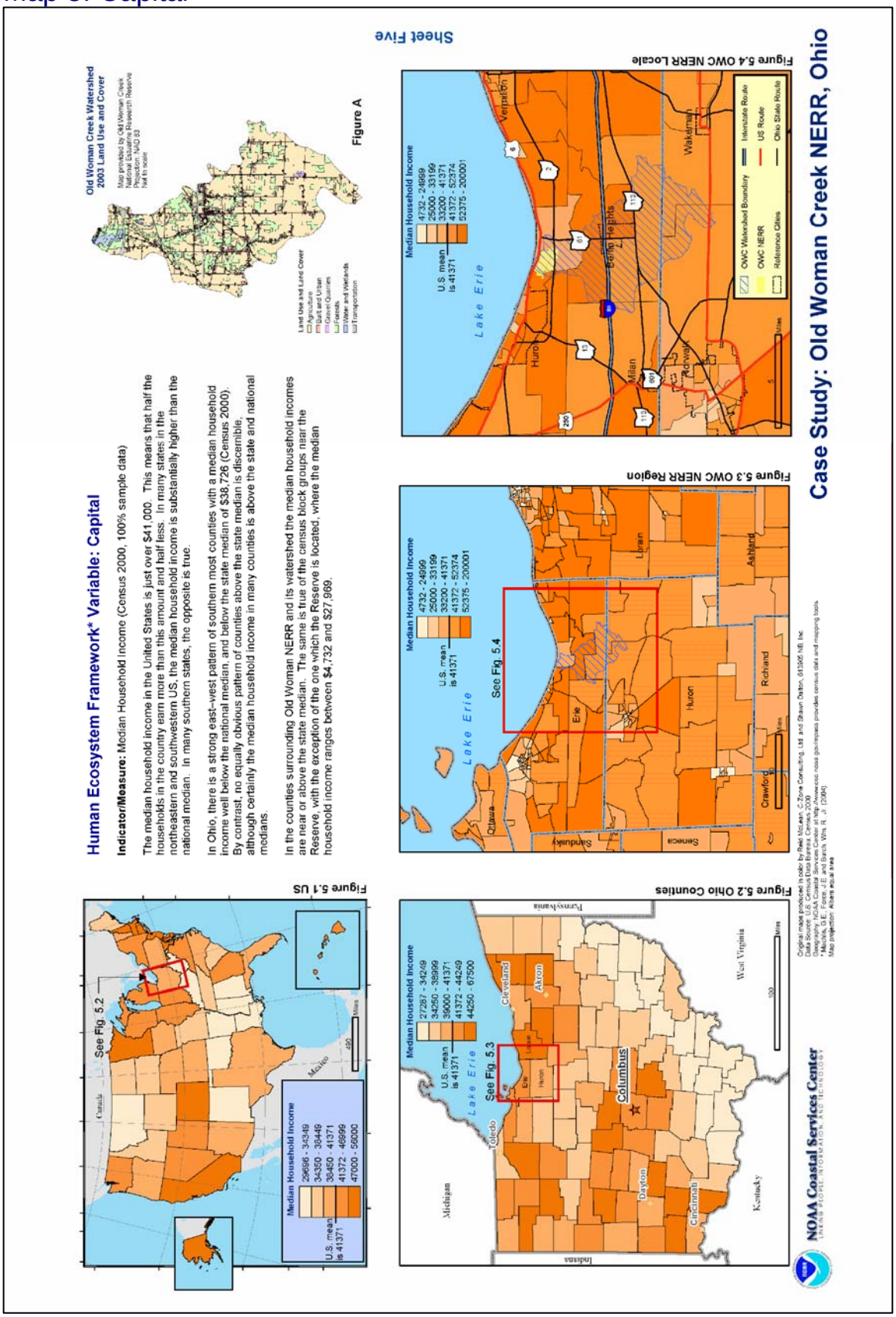
Map 3: Population Change



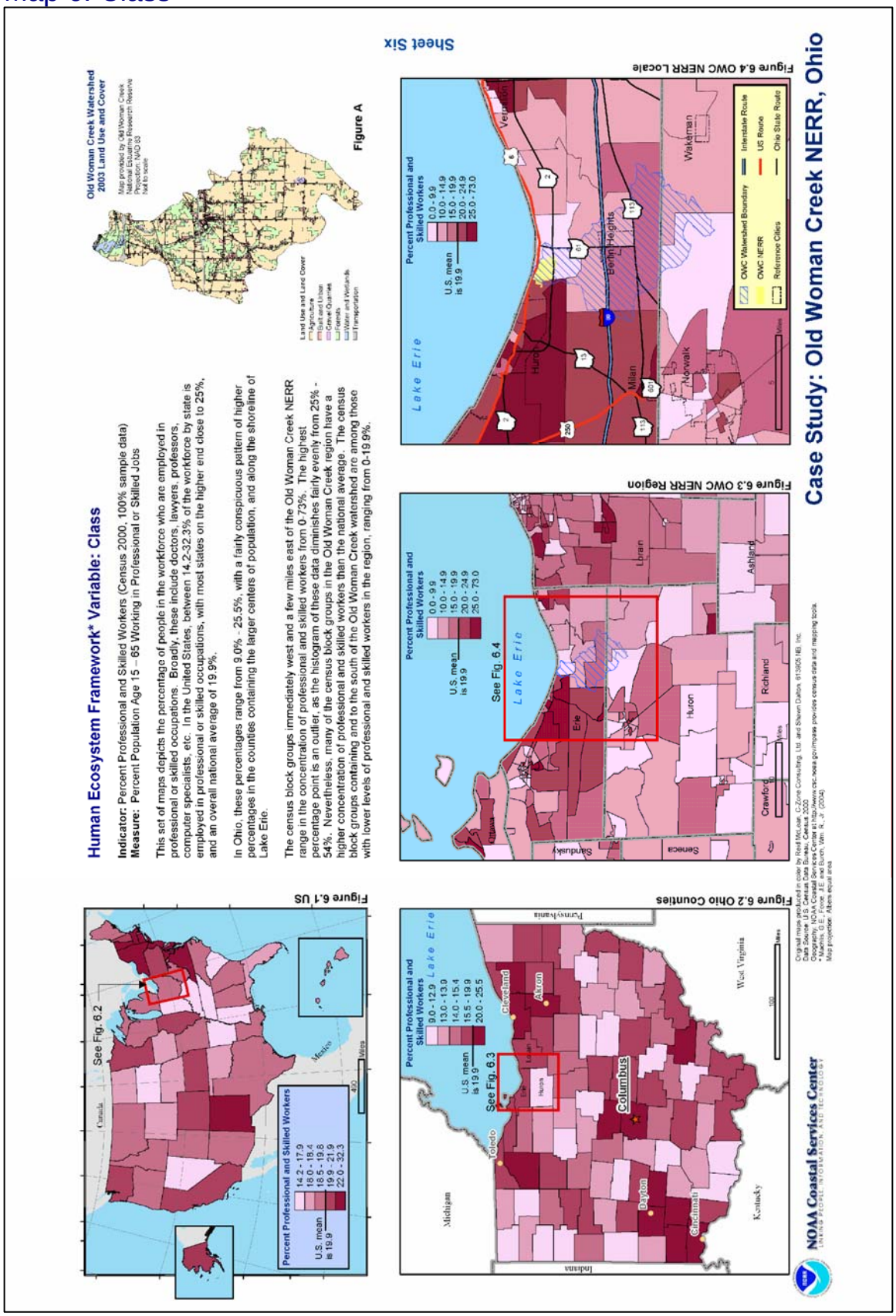
Map 4: Age


Sheet Four
Human Ecosystem Framework* Variable: Age
Indicator/Measure: Median Age of Total Population (Census 2000, 100% sample data)
The median age of the people in Ohio, at 37.5 years, is substantially higher than the national median of 35.5 years. This means that half of the people in the state are older than 37.5 years, and half are younger. However, there is a pattern of counties in Ohio in which the median age is below the national median, and this pattern mimics the pattern of high population density from southwest to northeast in the state.
In the counties near Old Woman Creek NERR, the median age is as low as the national median in some cases, and well over it in others. A closer look at the data revealed that the eldest person(s) in the region around the reserve was almost 85 years old in the year 2000, but that the last quantile clustered around 48-58 years old. The block groups of highest median age are located along the coast of Lake Erie. This pattern tells us that there is a potentially large cohort of people in very close proximity to the Old Woman Creek NERR who are currently in the workforce, but approaching retirement age within the next decade or so.
Old Woman Creek Watershed
2003 Land Use and Cover
Figure A
Figure 4.1 US
Figure 4.2 Ohio Counties
Figure 4.3 OWC NERR Region
Figure 4.4 OWC NERR Locale
Case Study: Old Woman Creek NERR, Ohio
NOAA Coastal Services Center

Map 5: Capital



Map 6: Class


Sheet Six
Human Ecosystem Framework* Variable: Class
Indicator: Percent Professional and Skilled Workers (Census 2000, 100% sample data)
Measure: Percent Population Age 15 – 65 Working in Professional or Skilled Jobs
This set of maps depicts the percentage of people in the workforce who are employed in professional or skilled occupations. Broadly, these include doctors, lawyers, professors, computer specialists, etc. In the United States, between 14.2-32.3% of the workforce by state is employed in professional or skilled occupations, with most states on the higher end close to 25%, and an overall national average of 19.9%.
In Ohio, these percentages range from 9.0% - 25.5%, with a fairly conspicuous pattern of higher percentages in the counties containing the larger centers of population, and along the shoreline of Lake Erie.
The census block groups immediately west and a few miles east of the Old Woman Creek NERR range in the concentration of professional and skilled workers from 0-73%. The highest percentage point is an outlier, as the histogram of these data diminishes fairly evenly from 25% - 54%. Nevertheless, many of the census block groups in the Old Woman Creek region have a higher concentration of professional and skilled workers than the national average. The census block groups containing and to the south of the Old Woman Creek watershed are among those with lower levels of professional and skilled workers in the region, ranging from 0-19.9%.
Old Woman Creek Watershed
2003 Land Use and Cover
Figure A
Land Use and Land Cover
Agriculture
Developed Urban
Gravel Quarries
Forests
Water and Wetlands
Transportation
Figure 6.1 US
See Fig. 6.2
Percent Professional and Skilled Workers
14.2 - 17.9
18.0 - 19.4
19.5 - 21.9
22.0 - 32.3
U.S. mean is 19.9
Figure 6.2 Ohio Counties
See Fig. 6.3
Lake Erie
Cleveland
Akron
Columbus
Toledo
Dayton
Cincinnati
Michigan
Indiana
Kentucky
West Virginia
Pennsylvania
Figure 6.3 OWC NERR Region
See Fig. 6.4
Sandusky
Erie
Huron
Lorain
Ashland
Richland
Crawford
Seneca
Ottawa
Figure 6.4 OWC NERR Locale
Vermilion
Berlin Heights
Milan
Norwalk
Wakeman
OWC Watershed Boundary
OWC NERR
Reference Cities
Interstate Route
US Route
Ohio State Route
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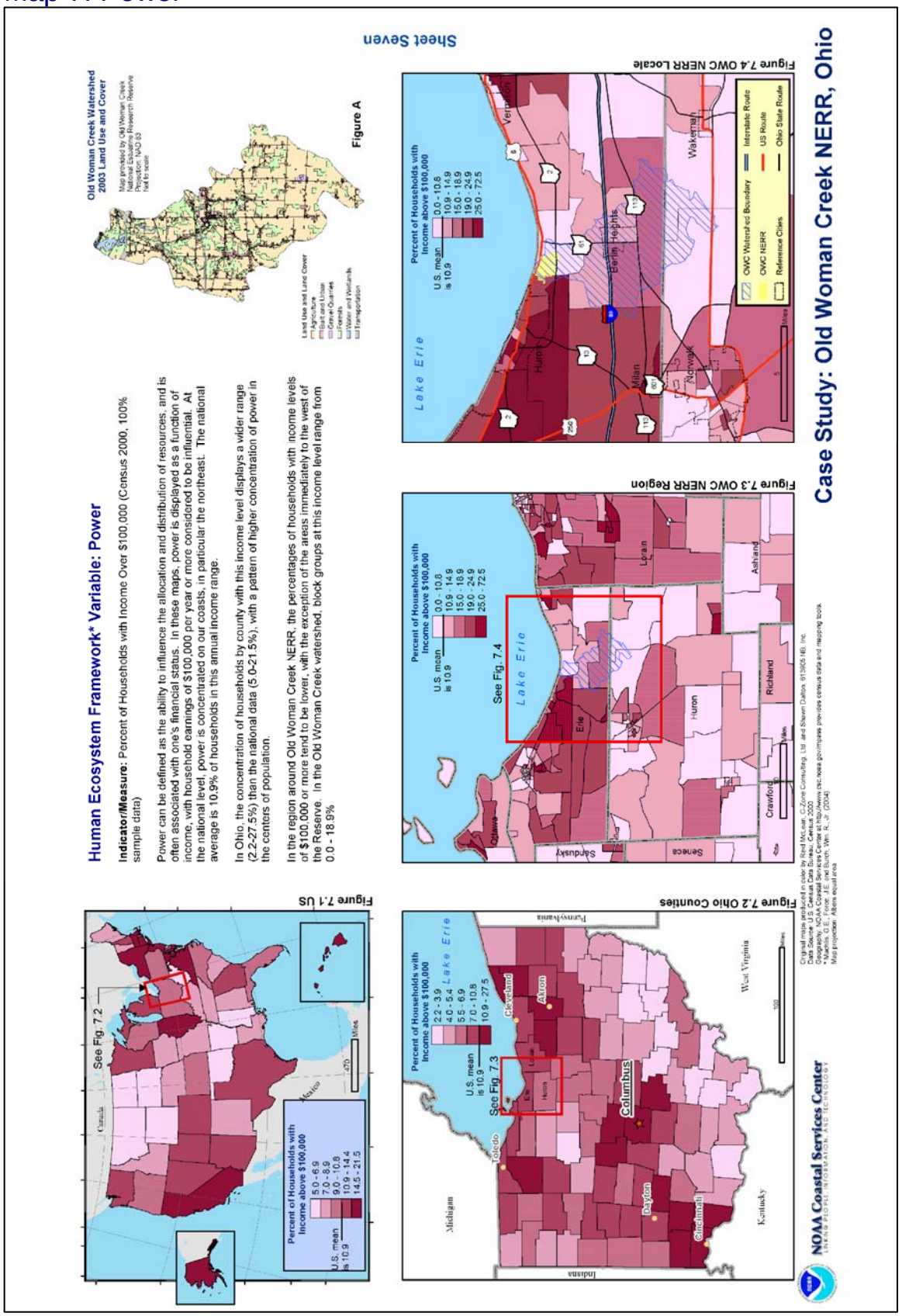
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Map 7: Power


Sheet Seven
Human Ecosystem Framework* Variable: Power
Indicator/Measure: Percent of Households with Income Over $100,000 (Census 2000, 100% sample data)
Power can be defined as the ability to influence the allocation and distribution of resources, and is often associated with one's financial status. In these maps, power is displayed as a function of income, with household earnings of $100,000 per year or more considered to be influential. At the national level, power is concentrated on our coasts, in particular the northeast. The national average is 10.9% of households in this annual income range.
In Ohio, the concentration of households by county with this income level displays a wider range (2.2-27.5%) than the national data (5.0-21.5%), with a pattern of higher concentration of power in the centers of population.
In the region around Old Woman Creek NERR, the percentages of households with income levels of $100,000 or more tend to be lower, with the exception of the areas immediately to the west of the Reserve. In the Old Woman Creek watershed, block groups at this income level range from 0.0 - 18.9%
Old Woman Creek Watershed 2003 Land Use and Cover
Figure A
Figure 7.1 US
Figure 7.2 Ohio Counties
Figure 7.3 OWC NERR Region
Figure 7.4 OWC NERR Locale
Case Study: Old Woman Creek NERR, Ohio
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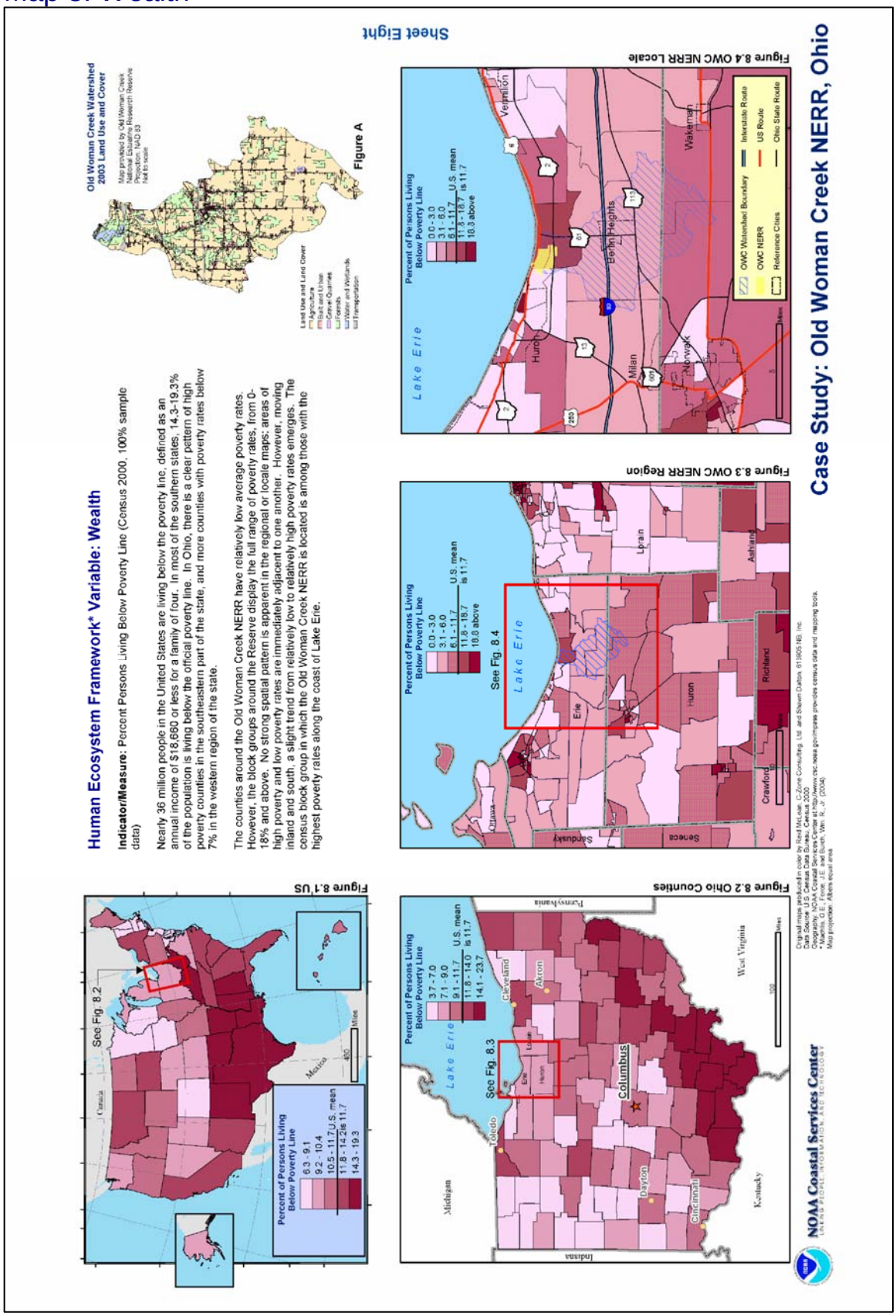
Map 8: Wealth


Sheet Eight
Human Ecosystem Framework* Variable: Wealth
Indicator/Measure: Percent Persons Living Below Poverty Line (Census 2000, 100% sample data)
Nearly 36 million people in the United States are living below the poverty line, defined as an annual income of $18,660 or less for a family of four. In most of the southern states, 14.3-19.3% of the population is living below the official poverty line. In Ohio, there is a clear pattern of high poverty counties in the southeastern part of the state, and more counties with poverty rates below 7% in the western region of the state.
The counties around the Old Woman Creek NERR have relatively low average poverty rates. However, the block groups around the Reserve display the full range of poverty rates, from 0-18% and above. No strong spatial pattern is apparent in the regional or locale maps; areas of high poverty and low poverty rates are immediately adjacent to one another. However, moving inland and south, a slight trend from relatively low to relatively high poverty rates emerges. The census block group in which the Old Woman Creek NERR is located is among those with the highest poverty rates along the coast of Lake Erie.
Old Woman Creek Watershed 2003 Land Use and Cover
Figure A
Figure 8.1 US
Figure 8.2 Ohio Counties
Figure 8.3 OWC NERR Region
Figure 8.4 OWC NERR Locale
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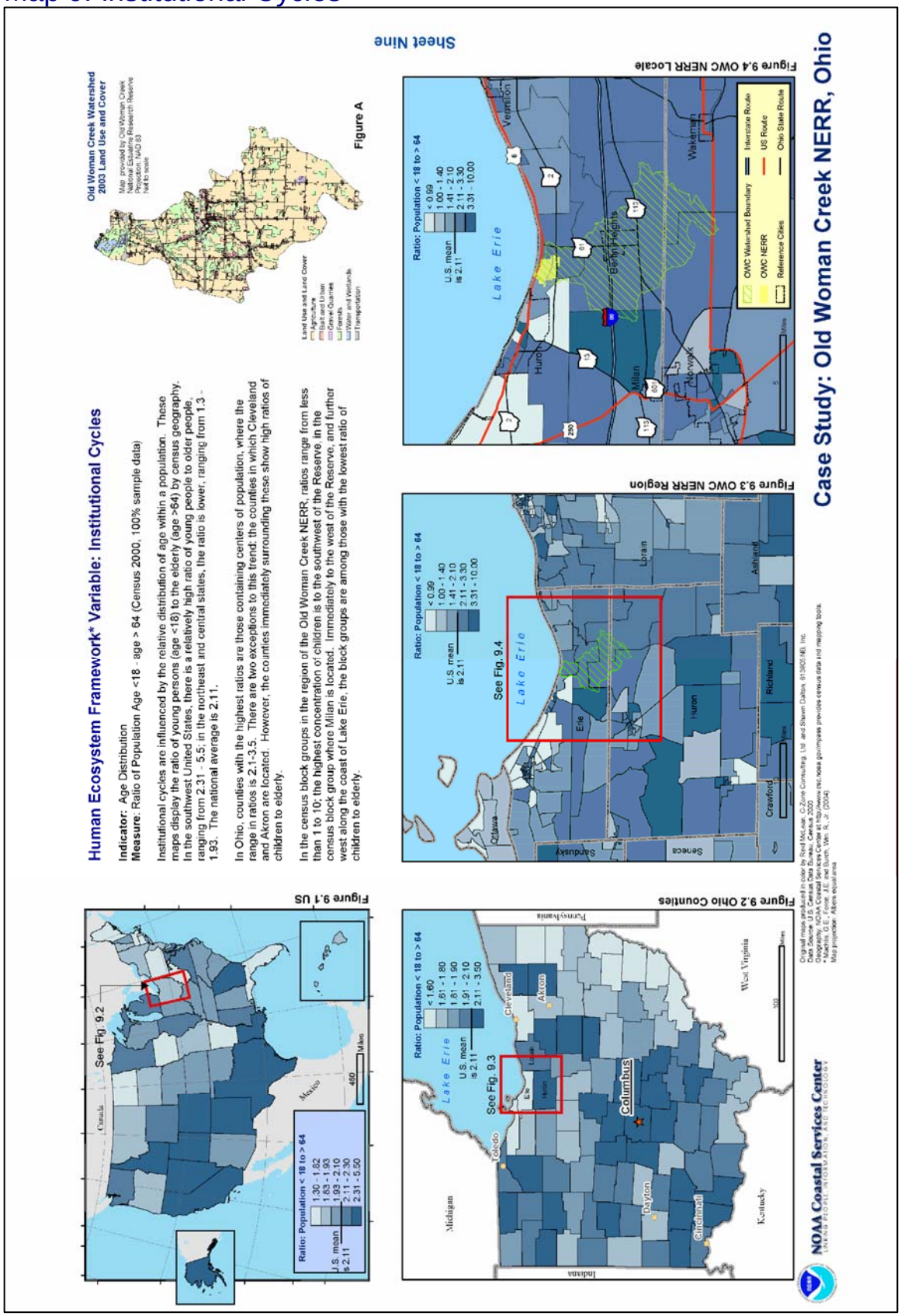
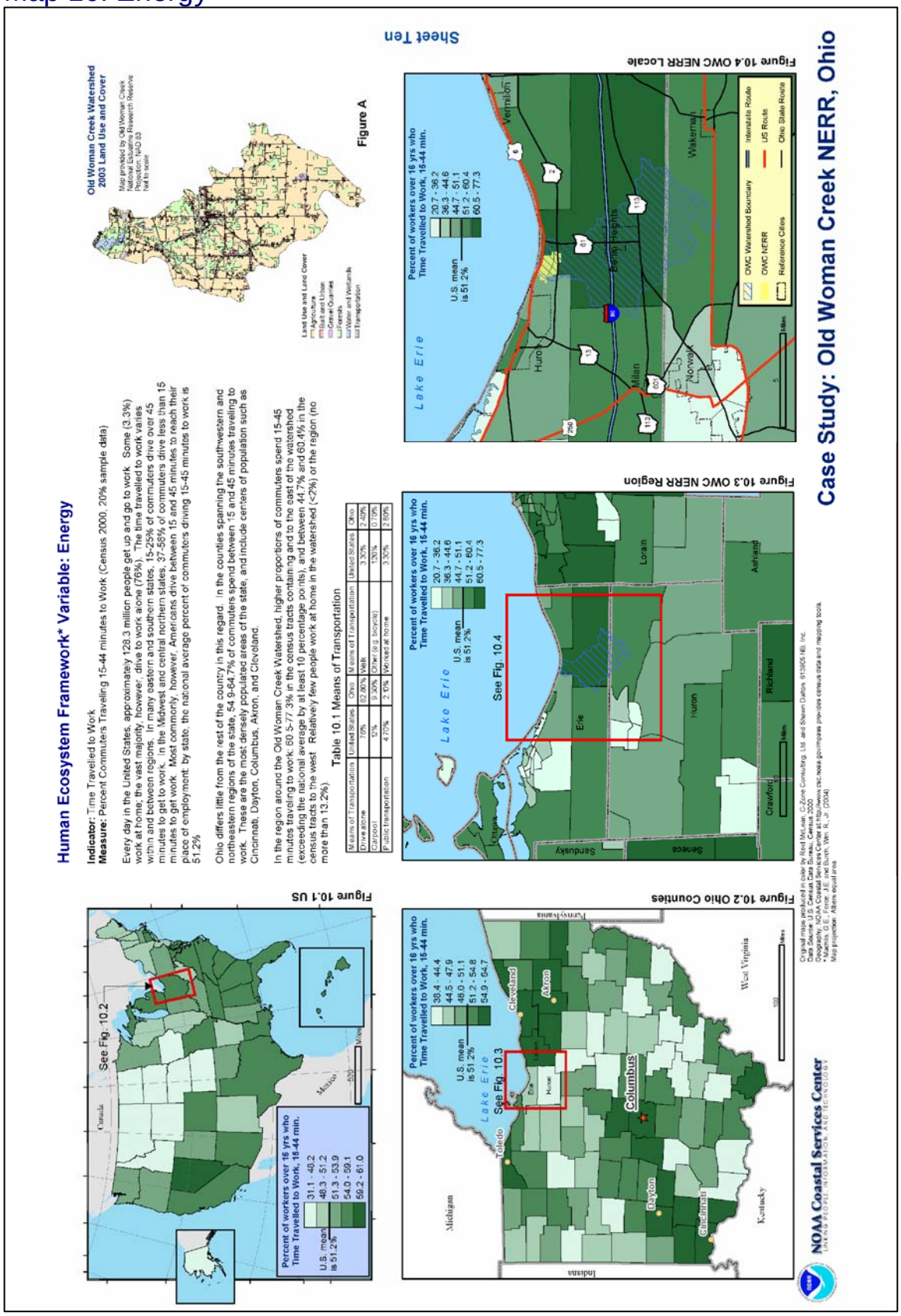
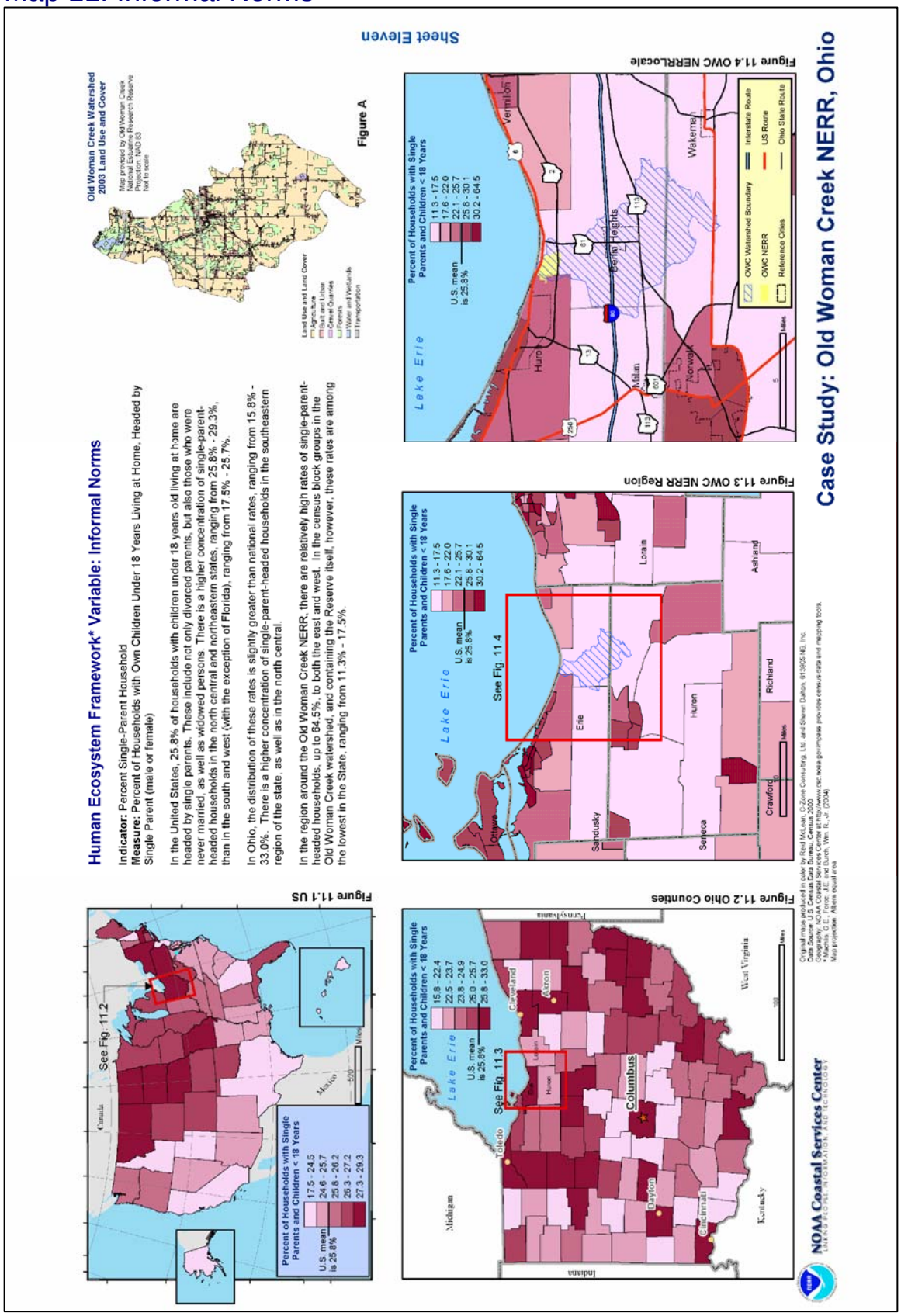
Map 9: Institutional Cycles



Map 10: Energy



Map 11: Informal Norms



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